Liquidity Risk Management: A Comparative Study between Domestic and Foreign Banks in Pakistan

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Abstract

The purpose of this study is to establish the firms level aspects which have more influence on the Credit risk managing of domestic and foreign banks in Pakistan. The study is based on secondary data from the period of 2001 to 2010. To check the stationarity of the data, Augmented Dickey Fuller test is used and Johansson's Co-integration is used for long run relationship. Linear regression model with OLS techniques is used for analysis. The relationship of bank size with liquidity risk is negative and significant in domestic banks and negative and insignificant in foreign banks. The relationship of debt to equity ratio with liquidity risk is negative and significant both in domestic and foreign banks. The relationship of liquid assets with liquidity risk is negative and insignificant in domestic banks and positive and significant in foreign banks. Based on the findings of the study it is recommended to establish more branches of domestic and enhance debt to equity ratio in order to liquidity risk.

Keywords: Risk management, liquidity risk, domestic banks, foreign banks, Pakistan

Introduction

The role of banking sector is very important in the economic and financial development of a country as this sector constitute one of the most fundamental parts of a country's economy. Over the 64 years of period there come many changes in the banking sector of Pakistan the number of commercial banks with more branch solidity and the fast technological alteration and enlarged competition has added stress on banks to increase its performance. At present 6 Islamic banks, 9 investment banks, 6 foreign banks and 24 conventional banks are operating in enormously competitive environment and this sector has

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appreciably enhanced its progress in the last few years and many foreign banks also set up their business in this area.

In the beginning, shortage of capital and uncertain environment bring political and socioeconomic disaster to the economy consequently improvement were made to make the power and role of State Bank of Pakistan with SBP Act 1956, which forced the private sector to make financial institutes and banks. In more privatization expansion of banking sector which started in 1992 motivated local investors and forced foreign banks (Ahmad et al. 2010).

In year 2008-09 total network of banking system in Pakistan was Rs. 638 billion and total assets were Rs. 5595 billion while in year 2003-04 network of banking system was Rs. 131 billion and total assets amount were Rs. 3003 billion.

Liquidity risk is the chance of loss due to bank's incapability to fund their obligations without any extra costs. The top management should create an efficient organizational makeup to constantly observe bank's liquidity.

Al-Tamimi and Al-Mazrooei (2007) investigated the UAE national and foreign banks with a sample of 17 banks. The data was collected through questionnaires and Pearson correlation and ordinary least square regression were used to test the data. The results indicated that these banks are more capable of managing risk and also found that there is a major differentiation between the UAE national and foreign banks in observing of risk assessment and analysis and in risk examine and controlling.

Gabbi (2004) focused on Liquidity Risk and the data was collected from authoritarian area of the green, yellow and red zone. He found that liquidity risk can be optimized through cash flow managing, stock and bond selection in particular components and through the management of short term financial items economies of scale can be achieved.

Vento and Ganga (2009) investigated the bank liquidity risk managing from the time period January 2004 to May 2008 with a sample of all Italian banks. The results showed up the most important features in order to implementing an efficient liquidity risk managing and to attain a more integrated decision making structure for global financial markets.

Sawada (2010) concentrated on the liquidity risk in Japan from the time period of 1926 to 1932. This study used the panel data with regression test and suggested that banks respond to the liquidity upset considerately throughout an increase in banks cash worth not by liquidate bank credit but by trading of securities in the economic market. The

security market improvement shell be concurrently treated in particular with respect to those states with weak financial structures.

Franck and Krausz (2007) investigated the liquidity risk in Israel and this study measured being of supporter to a bank the securities market may play a function alike to a lender of final option when banks suffer the liquidity deficiency. The results suggested that securities markets deal more for the banks liquidity as compared to a lender of final option.

Ismal (2010) studied the liquidity managing in Islamic banks of Indonesia and the sample chosen for the data collection was 17 Islamic banks and 409 individuals. The results found that organizations expanding reform the liquidity managing on both the asset and liability and stimulating the practice of the Islamic liquid appliances in the integrated plan.

Ahmed et al (2011) studied the Islamic banks of Pakistan with a sample of 6 Islamic banks for the time period of 2006 to 2009. The data was collected through secondary sources. Pearson correlation was used to find the relationship between variables and regression was used to find the coefficients. The results indicated that size of bank has directly associated with credit and liquidity risk, while its association with operational risk is found to be negative and statistically irrelevant. The asset management creates a positive link with liquidity and operational risk. The gearing ratio and Non Performing Loans ratio have a negative and significant association with both liquidity and operational risk while these have directly linked with credit risk. The capital adequacy has a negative and significant relationship with credit and operational risk, while it has positive association with liquidity risk.

Boussanni et al (2008) investigated the liquidity risk in the European financial organizations. The results of this study based on an in depth content analysis of the annual reports published by 21 of Western Europeans biggest financial set using the liquidity risk managing aspects planned by the Basel Committee on Banking administration and its Joint Forum in the time period of 2003 to 2006. The results of the study discovered an inconsistency among commercial banks from the similar or dissimilar European countries as to the level and degree of liquidity risk public financial disclosure. The results of the study also showed that financial groups that have earned a relatively less or more credit rating category were also the organizations that made the most absolute and wide liquidity risk managing financial exposure.

Akhtar et al (2011) focused on both conventional and Islamic banks of Pakistan using the sample of 12 banks for the time period of 2006 to 2009. The data was collected through secondary sources.

Pearson correlation was used to find the relationship between variables and regression was used to find the coefficients. The results showed that size of the bank and net-working capital to net assets has positive but irrelevant association with liquidity risk in both conventional and Islamic banks. Capital adequacy ratio in conventional banks and return on assets in Islamic banks are positive and considerable. Involvement of return on assets in conventional banks and capital adequacy ratio in Islamic banks has to be positive but insignificant. In addition the study establishes that better performance in essentials of assets and return confirmed that conventional banks had enhanced profitability and liquidity risk managing as compared to Islamic banks.

Objectives

The present study focus on the following objectives

- To identify the variables that affect liquidity risk in domestic banks in Pakistan.
- To analyze the variables which affect liquidity risk in foreign banks in Pakistan.

Materials and Methods

Data of 10 banks over the period 2001-2010 taken from bank's annual reports were used. Financial data from these annual reports was used to calculate and to evaluate the liquidity risk management of domestic and foreign banks in Pakistan. Augmented Dickey Fuller test is used to test the stationarity of the data Johansson's Co integration test is used to find the long term relationship. The following Linear Regression model is used for analysis with OLS techniques.

$$\text{Liquidity Risk} = \beta 0 + \beta 1\ \text{LNA} + \beta 2\text{D/E} + \beta 3\text{IAR} + \beta 4\text{ROE} + \beta 5\ \text{LA} + \varepsilon$$

Table 1: Variables Description

Variables	Equations
Liquidity Risk (LR)	Capital/Total Assets
Bank Size	Logarithm of Total Assets
Debt to equity ratio (D/E)	Total company debt/equity
Investment to Asset Ratio	Investment/Total Asset
Return on Equity (ROE)	EACS/Total Equity
Liquid Assets (LA)	Total Loans/ Total Deposits

Hypothesis

H0: There is no linkage between firm's level aspects with liquidity risk.
H1: There is linkage between firm's level aspects with liquidity risk.

Results and Discussion

Results of Augmented Dickey Fuller test Domestic Banks:
Table 2: Results of Augmented Dickey Fuller Test (Intercept):

Variables	t-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Results
Liquidity Risk	-4.922923[0]	-2.5983	-2.9215	-2.5983	I(0)
Bank Size	-7.870350[0]	-3.5713	-2.9228	-2.5990	I(1)
Debt to equity ratio	-4.483613[0]	-3.5682	-2.9215	-2.5983	I(0)
Investment to Assets ratio	-4.300792[0]	-3.5682	-2.9215	-2.5983	I(0)
ROE	-9.395016[0]	-3.5713	-2.9228	-2.5990	I(1)
Liquid Assets	-9.993944[0]	-3.5713	-2.9228	-2.5990	I(1)

Note: [ ] indicate the lag value

Liquidity risk, Debt to Equity ratio and Investment to Total Assets are stationary at level with lag zero, while Bank Size, Return on Equity and Liquid Assets are found stationary at first difference with lag zero, t-statistic values of all variables are greater than their critical values.

Table 3: Results of Augmented Dickey Fuller Test (Trend and Intercept):

Variables	t-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Results
Liquidity Risk	-4.887657[0]	-4.1540	-3.5025	-3.1804	I(0)
Bank Size	-7.805063[0]	-4.1540	-3.5025	-3.1804	I(1)
Debt to equity ratio	-4.452838[0]	-4.1540	-3.5025	-3.1804	I(0)
Investment to Assets ratio	-4.466201[0]	-4.1540	-3.5025	-3.1804	I(0)
ROE	-4.408016[2]	-4.1678	-3.5025	-3.1804	I(1)
Liquid Assets	-4.554013[0]	-4.1540	-3.5025	-3.1804	I(0)

Note: [ ] indicate the lag value

Liquidity risk, Debt to Equity ratio, Investment to Total Assets and Liquid Assets are stationary at level with lag zero, while Bank Size is found stationary at first difference with lag zero and Return on Equity is found stationary at first difference with lag two when both intercept and trend were included.

Foreign Banks

Table 4: Results of Augmented Dickey Fuller Test (Intercept):

Variables	t-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Results
Liquidity Risk	-8.041687[0]	-3.5713	-2.9228	-2.5990	I(1)
Bank Size	-8.448631[0]	-3.5713	-2.9228	-2.5990	I(1)
Debt to equity ratio	-8.211985[0]	-3.5713	-2.9228	-2.5990	I(1)
Investment to Assets ratio	-4.286060[0]	-3.5682	-2.9215	-2.5983	I(0)

ROE	-3.764415[0]	-3.5682	-2.9215	-2.5983	I(0)
Liquid Assets	-9.514072[0]	-3.5713	-2.9228	-2.5990	I(1)

Note: [ ] indicate the lag value

Liquidity risk, Debt to Equity ratio, Bank Size, and Liquid Assets are stationary at first difference with lag zero, while Return on Equity and Investment to Total Assets are found stationary at level with lag zero in foreign banks when intercept is included only.

Table 5: Results of Augmented Dickey Fuller Test (Trend and Intercept):

Variables	t-Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Results
Liquidity Risk	-7.957316[0]	-4.1584	-3.5045	-3.1816	I(1)
Bank Size	-8.378490[0]	-4.1584	-3.5045	-3.1816	I(1)
Debt to equity ratio	-8.127467[0]	-4.1584	-3.5045	-3.1816	I(1)
Investment to Assets ratio	-4.824136[0]	-4.1584	-3.5045	-3.1816	I(0)
ROE	-4.211930[0]	-4.1584	-3.5045	-3.1816	I(0)
Liquid Assets	-9.410339[0]	-4.1584	-3.5045	-3.1816	I(1)

Note: [ ] indicate the lag value

Liquidity risk, Debt to Equity ratio, Bank Size, and Liquid Assets are stationary at first difference with lag zero, while Return on Equity and Investment to Total Assets are found stationary at level with lag zero in foreign banks when intercept and trend were included.

Johanson's Co-integration Test Results

Table 6: Domestic Banks

Variables	Eigen value	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
Liquidity Risk	0.709669	210.0356	156.00	168.36	None **
Debt to equity ratio	0.429582	97.48347	94.15	103.18	At most 1*
Investment to Assets ratio	0.427056	70.53693	68.52	76.07	At most 2*
Liquid Assets	0.335910	43.80246	47.21	54.46	At most 3
ROE	0.144516	13.16593	15.41	20.04	At most 4
Bank Size	0.111483	5.673691	3.76	6.65	At most 5

**(**) denotes rejection of the hypothesis at 5%(1%) significance level*
L.R. test indicates 3 co-integrating equation(s) at 5% significance level

The above results of Johansen's co-integration test shows that Liquidity Risk has co-integration because its likelihood ratio is greater than the critical values at 5% and 1% significance level. So we can reject the null hypothesis Ho that can explain there is no co-integration between dependent and independent variables and accept alternative hypothesis H1 that can explain there is a co-integration between dependent and independent variables.

Table 7: Foreign Banks

Variables	Eigen value	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
Liquidity Risk	0.782501	203.9838	156.00	168.36	None **
Debt to equity ratio	0.497764	82.68788	94.15	103.18	At most 1
Investment to Assets ratio	0.319481	49.63099	68.52	76.07	At most 2
Liquid Assets	0.247850	31.15580	47.21	54.46	At most 3
ROE	0.090205	7.270422	15.41	20.04	At most 4
Bank Size	0.055341	2.732721	3.76	6.65	At most 5

**(**) denotes rejection of the hypothesis at 5%(1%) significance level*
L.R. test indicates 1 co-integrating equation(s) at 5% significance level

The results of Johansen's co-integration test for foreign banks show that only co-integrating relationship exist among the variables as the

likelihood ratio value is greater than critical value for Liquidity Risk at 5%.

Regression Analysis

Domestic Banks
Liquidity Risk = 0.689 - 0.0202 LNA - 0.0832 D/E -0.000002 IAR - 0.000527 ROE - 0.0137 LA

Predictor	Coefficient	Standard Deviation	T	P
Constant	0.6886	0.1154	5.96	0.000
Bank Size	-0.020189	0.005980	-3.38	0.002
Debt to equity ratio	-0.083247	0.009553	-8.71	0.000
Investment to Assets ratio	-0.00000213	0.00000134	-1.59	0.119
ROE	-0.0005273	0.0007183	-0.73	0.467
Liquid Assets	-0.01371	0.09503	-0.14	0.886

R Square (Adjusted) = 76.2% F = 32.31 P = 0.000 Durbin-Watson statistic = 1.75

The value of Probability F-statistic in this model is 0.000 which represents that the model is good fitted and highly significant. The value of R-square (adjusted) shows that nearly 76.2% change in the dependent variable is due to the variables under study while the 23.8% is due to other those variables that are not included in this study. The Investment to Assets ratio, ROE and Liquid Assets found to have negative but insignificant relationship with liquidity risk while bank size and debt to equity ratio have found to be negative and significant relationship with liquidity risk. The value of Durbin-Watson statistic is 1.75 means that there is no autocorrelation in the model.

Foreign Banks
Liquidity Risk = 0.578 - 0.00654 LNA - 0.164 D/E - 0.0452 IAR - 0.00114 ROE + 0.0468 LA

Predictor	Coefficient	Standard Deviation	T	P
Constant	0.5781	0.1288	4.49	0.000
Bank Size	-0.006542	0.008110	-0.81	0.424

Debt to equity ratio	-0.163923	0.006958	-23.56	0.000
Investment to Assets ratio	-0.04522	0.07353	-0.61	0.542
ROE	-0.001135	0.001218	-0.93	0.356
Liquid Assets	0.04676	0.01905	2.46	0.018

R Square (Adjusted) = 96.1% F = 239.80 P = 0.000 Durbin-Watson statistic = 0.69

The value of R-square (adjusted) shows that nearly 96.1% change in the dependent variable is due to the variables under study while the 3.9% is due to other those variables that are not included in this study. The Investment to Assets ratio, ROE and bank size found to have negative but insignificant relationship with liquidity risk while Liquid Assets have positive and debt to equity ratio have negative and significant relationship with liquidity risk at 5% and 1% respectively.

Conclusion

This study examines the liquidity risk management by taking comparative study between Domestic and Foreign banks in Pakistan. The study found that the relationship of bank size with liquidity risk is negative and significant in domestic banks and negative and insignificant in foreign banks. The relationship of debt to equity ratio with liquidity risk is negative and significant both in domestic and foreign banks. The relationship of investment to assets ratio with liquidity risk is negative and insignificant both in domestic and foreign banks. The relationship of Return on equity with liquidity risk is negative and insignificant both in domestic and foreign banks. The relationship of liquid assets with liquidity risk is negative and insignificant in domestic banks and positive and significant in foreign banks. Based on the findings of the study it is recommended that liquidity risk may be minimized by enhancing domestic banks size and minimizing debt to equity ratio.

References

Ahmed, N., Akhtar, M. F., & Usman, M. (2011). "Risk Management Practices and Islamic Banks: An Empirical Investigation from Pakistan". *Interdisciplinary Journal of Research in Business*, 1 (6)50-57.

Akhtar, M. F., Ali, K., & Sadaqat, S. (2011). "Liquidity Risk Management: A comparative study between Conventional and Islamic Banks of Pakistan". *Interdisciplinary Journal of Research in Business*, 1 (1), 35-44.

Al-Tamimi, H. 2002, "Risk management practices: an empirical analysis of the UAE commercial banks", *Finance India*, Vol. 16 No. 3, pp. 1045-57.

Al-Tamimi, H. H. & Al-Mazrooei, F. M. (2007). "Banks' risk management: a comparison study of UAE national and foreign banks". *The Journal of Risk Finance* 8(4). pp. 394-409.

Boussanni..A, Desrochers.J & Préfontaine.J (2008), "Liquidity Risk Financial Disclosure: The Case of Large European Financial Groups", *International Business & Economics Research Journal* Volume 7 (7).

Franck.R, & Krausz. M, (2007). "Liquidity risk and bank portfolio allocation", *International Review of Economics and Finance* 16. pp. 60–77

Gabbi, G. (2004). "Measuring Liquidity Risk in a Banking Management Framework". *Managerial Finance, 30*, pp. 44-58.

Gray, J. and Hamilton, J. (2006). *Implementing Financial Regulation: Theory and Practice*. Wiley, Chichester.

Ismal, R. (2010)."Assessment of liquidity management in Islamic banking industry". *International Journal of Islamic and Middle Eastern Finance and Management* , 3 (2), 147-167.

Sawada (2010). "Liquidity risk and bank portfolio management in a financial system without deposit insurance: Empirical evidence from prewar Japan", *International Review of Economics and Finance* 19. pp. 392–406.

Vento, G. A., & Ganga, P. L. (2009). "Bank Liquidity Risk Management and Supervision: Which ". *Journal of Money, Investment and Banking* (10), 79-126.